

DUMBBELL WITH QUICK RELEASE BOLT

This invention relates to dumbbells and particularly to a set of dumbbells that feature quick removal of plates with a quickly removable retaining bolt for changing the weight of the dumbbell as well as quickly changing to a longer retaining bolt for operating in a greater weight range when required.

BACK GROUND AND INFORMATION DISCOSURE:

A dumbbell set is a pair of weights, one dumbbell in each hand, with which various exercises are performed such as curls, overhead press, supine press, and just about any motion holding the weight and moving the arms.

The original dumbbell, before the turn of the last century came into use consisting of a bar about twelve inches long to which were secured (plates) weights and collars for securing the weights. According to this arrangement, each bar had one pair of collars, centrally located on the bar and spaced from one another to permit grasping the center of the bar with one hand, with replaceable weights located on both ends of the bar held by retaining collars. The weights are typically cast iron plates having central apertures through which the handle is inserted. The weight is selected by choosing plates having

appropriate thickness and diameter.

For safety sake, it is important that that the collars be secured very reliably to the bar. This is because the exercises generally involve swinging the dumbbells in a manner such that the weights could be flung off the handles in unpredictable directions if the collars become loose and separate during the exercise.

For many years, each collar has been a metal ring that slides onto the end of the bar. The ring is secured to the bar by a set bolt screwed through the metal ring against the bar. The head of the bolt is typically a "tee" that permits the user to apply greater torque when screwing the bolt against the bar to replace the plates.

This arrangement is not entirely reliable. The set bolts occasionally loosen regardless of the effort to tighten the bolt. At the least, this is an annoying interruption of the exercise.

Another persistent annoyance is the requirement to change the weight of each exercise. This requires loosening the bolt, sliding the ring off the handle, adding or subtracting the required weight, and then sliding and securing the ring back onto the handle.

Another problem with this design is the extension of the bar end and collar past the plates which interferes with the users ability to rest the dumbbells on his knees with the dumbbell handles oriented vertically.

U.S. Patent 6,039,678 to Dawson discloses a dumbbell including a handle being a tube with an internal thread and a pair of fixed "stop" plates, one "stop" plate mounted on one end of the handle and the other "stop" plate mounted on the other end of the handle. A pair of threaded shafts is provided. Each shaft has a "retainer" plate on one end. The opposite end is screwed into a respective end of the threaded tube.

A stack of weight plates is mounted on each shaft. Each of the weight plates has a slot extending from a central opening to the edge of the plate so that the plate can "straddle" the tube. The weight plate is mounted on the respective shaft by unscrewing the shaft sufficiently (partially) out of the handle to permit sliding the shaft through the slot and then tightening the stack of weights between the respective retaining plate and stop plate. Each weight plate has a convex dimple in its surface which engages a concave dimple in a neighboring weight plate. When the stack is tightly clamped between the stop plate and retainer plate, the engaging dimples prevent slippage of the weight plate off the shaft. However, if the stack becomes loose while performing the exercise, the weight plate can slip off the handle.

Another problem is that, the stop plate is susceptible to being bent when the dumbbell is dropped so that the dimples no longer secure the stack to the handle.

SUMMARY OF THE INVENTION:

It is an object of this invention to provide a dumbbell set that enables a user to change weight with greater speed and convenience than dumbbell sets of the present art.

It is another object that the dumbbell set be less susceptible to damage than sets of the present art.

It is another object to display the weight on the dumbbell.

This invention is directed toward a dumbbell comprising a handle being a tube about seven inches long. The interior surface of the tube is threaded. A 'stop" plate, preferably rectangular, is concentrically and perpendicularly mounted opposite another stop plate on the other end of the tube.

Each stop plate has a centrally located aperture providing access for inserting a retainer shaft into each end of the tube.

Each retainer shaft has a (preferably square) retainer plate mounted concentrically and perpendicularly onto an end of the retainer shaft. The retainer shaft has a diameter selected to be a slideable fit into the tube.

The interior threaded surface of the tube has a straight groove extending from one end of the tube to the opposite end. The shaft has an external partial thread on one side extending along the length of the shaft. The thread has a width selected to permit sliding the shaft into the tube when the partial thread is aligned with the groove. After inserting the shaft into the tube, the disk handle is turned so that the partial thread on the shaft engages the thread on the interior surface of the tube.

The retainer is thereby locked into position relative to the handle. Weight plates mounted on the retainer shaft are secured between the retainer plate and the stop plate.

The thickness of each weight plate is an integer multiple of the pitch of the partial thread (threads per inch). Therefore the user can immediately determine that the retainer is completely secured by a marking on the retainer plate indicating that the orientation of the retainer plate.

Indicia on surface of the shaft which is visible through a pair of apertures in the handle

provide a convenient indication of the amount of weight on the dumbbell.

The foregoing summary has highlighted features, aspects and advantages of the present invention. The invention is further explained by the following description of what I presently believe to be the best mode for carrying out the invention illustrated by drawings to which are appended claims which define the scope of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 shows the assembled dumbbell of this invention.

Fig. 2 shows an exploded view of the dumbbell.

Fig. 3 shows the dumbbell plate with a slated edge.

Fig. 4A is a perspective view showing an end of the retainer with the partial thread.

Fig. 4B is an end view of the dumbbell showing the stop plate, the groove and the thread on the interior surface of the tube.

Fig. 5 shows the retainer poised for insertion into the tube.

Fig. 6 shows the scale for indicating weight of the loaded dumbbell.

Fig. 7 shows a composite retainer plate.

DESCRIPTION OF A BEST MODE:

Turning now to a discussion of the drawings, fig. 1 shows a plan view of a pair of the dumbbells 10 of this invention. Fig. 2 is an exploded view of one dumbbell 10 shown in fig. 1.

There are shown a dumbbell handle being a tube 12 with a thread 14 on an internal surface that extends from one end of tube 12 to the other end. As shown to best advantage in the end view of the tube 12 in fig. 4B, a groove 16 is formed in the internal surface of tube 12 that extends from one end of tube 12 to the other end.

A square "stop" plate 18 is mounted perpendicularly and concentrically on each end of the tube 12.

A retainer 20 is shown being a retainer plate 22 mounted concentrically and perpendicularly on one end of a shaft 24. The shaft 24 has a partial thread 26 on one side of its surface extending the entire length of shaft 24.

As shown in fig. 5, the shaft 24 with its partial thread 26 and groove 16 is poised for slideably telescoping the shaft 24 into the tube 12.

Weight plates 30 (shown in fig.1 and to better advantage in fig. 3) are preferably square and have a central aperture 32.

The stack of weight plates are mounted onto the dumbbell 10 by inserting the shaft 24 through aperture 32, aligning the partial thread 26 with groove 16 and then sliding the shaft 24 into the tube 12. The stack of weights is secured by rotating the retainer plate 22 so that the partial thread 26 on the shaft 24 engages the internal thread 16 of the tube 12 thereby securing the stack of weight plates 30 between the retainer plate 22 and stop plate 18.

The thickness of each weight plate 30 is a multiple integral of the pitch of the partial thread 26 so that, when the stack of weights is secured between the disk 22 and the stop plate 18, the disk will always have the same orientation regardless of how many weight plates 30 are mounted on the dumbbell 10.

Figs. 5 and 6 show an embodiment in which the edge 36 of each weight plate 30 is slanted

The slanted 36 enables the user to lean the weight plates against the stop plate 18 to facilitate inserting the shaft into the tube 12.

Fig. 6 shows another embodiment according to which the user can instantaneously determine the weight of the stack on the dumbbell 10. The weight plates 30 are preferably square. Each plate has a thickness equal to a multiple of a common thickness. The stack of weight plates 30 are shown in phantom in fig. 6. A scale 32 is engraved on the shaft 24 and extends from one end to the other end of the shaft 24.

A hole 34 is formed in the tube 12 next to the stop plate and positioned so that, when the shaft is screwed into the tube sufficiently far to secure the weight plates 30 on the dumbbell 10, the weight of the dumbbell 10 with stack 30 is indicated by the scale number on the shaft 24 that is visible through the hole in the tube 12.

Fig. 7 shows another embodiment in which the retainer plate on the retainer 20 is a composite of a thick rubber 40 laminated to a metal plate 42. The advantage of the rubber lamination 40 is that, when the retainer is screwed against the weight, the retainer is effectively "spring loaded" against the weight plate 30 so that loosening of the retainer plate 40 on the shaft 24 is prevented.

The dumbbell of this invention has several advantages over dumbbells of the prior art.

One advantage is the ease with which the weight is changed together with the security of

complete engagement of the weight plate on the shaft.

Another advantage is the angled edges of each weight plate so that plates lean together and alignment of the holes through the plates is maintained. Insertion of the shaft through the aligned holes is facilitated for loading the plates onto the shaft.

Another advantage is convenient reading of the weight loaded on the handle through the aperture in the handle.

Another advantage provided by the rubber laminated retainer disk is that, by screwing the shaft to where the rubber on the retainer plate is forced against the stack of weights, the compressed rubber biases against loosening of the retainer plate.

Variations of this invention contemplated after reading the specification and studying the drawings may be contemplated that are within the scope of the invention.

For example, the entire surface of the retainer plate may be coated with a protective rubber coating. The rubber coating on the retainer plate reduces the danger associated with conventional dumbbells where the end of the handle extends out of the end of the stack of weights. The extending handle of the conventional dumbbell poses the danger of

gouging the thigh of the user as he swings the dumbbell.

I therefore wish to define the scope of my invention by the appended claims.